

Claims

- [c1] 1. A multiple battery system comprising:
a main battery having a main positive output and a main negative output;
at least one auxiliary battery having an at least one auxiliary positive output and an at least one auxiliary negative output; and
a main electrical circuit comprising a coupling of a common positive terminal with an at least one switching device, the at least one switching device having at least two operating positions to selectively couple the main and at least one auxiliary battery to the common positive terminal, wherein a first operating position of the at least two operating positions provides electrical charge to both the main battery and the at least one auxiliary battery; and
a controller coupled to the main electrical circuit and switching said at least one switching device based on input from an at least one sensor.
- [c2] 2. The multiple battery system of claim 1, further comprising a first operating position of the at least two operating positions that couples the common positive terminal to the main positive output of the main battery

and the common positive terminal to a one-way charging circuit that precedes and is coupled to the at least one auxiliary positive output on the at least one auxiliary battery.

[c3] 3. The multiple battery system of claim 2, further comprising a second operating position wherein the common positive terminal is coupled through the at least one switching device to a point in the main electrical circuit, beyond the one-way charging circuit, that couples to the auxiliary positive output.

[c4] 4. The multiple battery system of claim 3, wherein the main battery is electrically isolated from the at least one auxiliary battery in the second operating position of the at least two operating positions of the at least one switching device.

[c5] 5. The multiple battery system of claim 3, wherein only the coupling of the positive output of the main battery and the positive output of the at least one auxiliary battery are switched by the switching device.

[c6] 6. The multiple battery system of claim 3, wherein the second operating position of the at least two operating positions electrically isolates the main battery from the system and introduces only the at least one auxiliary

battery.

- [c7] 7. The multiple battery system of claim 3, wherein the controller further comprises an at least one indicator element.
- [c8] 8. The multiple battery system of claim 7, wherein the at least one indicator element is at least one of a klaxon, a horn, a light, a plurality of lights, an LCD panel, a simulated human voice, a human voice, a light emitting diode, a plurality of light emitting diodes.
- [c9] 9. The multiple battery system of claim 3, wherein the at least one indicator element is a plurality of indicator elements having at least one of a red, orange, green, or amber color.
- [c10] 10. The multiple battery system of claim 3, wherein the battery system further comprises a battery housing with a main battery compartment containing the main battery and an at least one auxiliary battery compartment containing the at least one auxiliary battery.
- [c11] 11. The multiple battery system of claim 10, wherein the main battery compartment is located atop the at least one auxiliary battery compartment.
- [c12] 12. The multiple battery system of claim 3, wherein the

main battery compartment is located aside the at least one auxiliary battery compartment.

[c13] 13. The multiple battery system of claim 3, wherein the one-way charging circuit comprises an at least one one-way charging diode.

[c14] 14. The multiple battery system of claim 13, wherein the at least one one-way charging diode further comprises an at least one silicon rectifier.

[c15] 15. The multiple battery system of claim 13, wherein the at least one one-way charging diode further comprises an at least one Silicon Controlled Rectifier (SCR).

[c16] 16 The multiple battery system of claim 15, wherein the at least one Silicon Controlled Rectifier (SCR) is coupled to the controller and disables the coupling with the at least one auxiliary battery

[c17] 17. The multiple battery system of claim 3, wherein the at least one auxiliary battery comprises a single auxiliary battery.

[c18] 18. The multiple battery system of claim 3, wherein the at least one battery comprises a plurality of auxiliary batteries.

[c19] 19. The multiple battery system of claim 15, wherein the

at least one sensor further comprises an at least one of:
an at least one main battery voltage sensor, an at least
one main battery amperage sensor, an at least one aux-
iliary battery voltage sensor, an auxiliary battery amper-
age sensor, an at least one switch position sensor.

[c20] 20. The multiple battery system of claim 3, wherein the
controller further comprises at least one of: an at least
one microprocessor, an at least one signal processor, an
at least one set of lookup tables, an at least one memory
device, an at least one security protocol/encryption ele-
ment. and an at least one indicator element.

[c21] 21. The multiple battery system of claim 3, wherein the
controller is a wireless controller system.

[c22] 22. The multiple battery system of claim 21, wherein the
wireless controller system further comprises a wireless
controller, a wireless transceiver, and an input device.

[c23] 23. The multiple battery system of claim 22, wherein the
input device is a wireless input device and further com-
prises an at least one indicator element.

[c24] 24. The multiple battery system of claim 3, wherein the
controller is a network interfaceable controller, the net-
work interfaceable controller further comprising a net-
work interface and transceiver.

[c25] 25. The multiple battery system of claim 24, wherein the network interfaceable controller is in communication with a Network Operations Center (NOC) via a network.

[c26] 26. The multiple battery system of claim 25, wherein the network interfaceable controller couples to and communicates with the at least one switching device to detect the position of the at least one switching device and selectively engages the at least one switching device based on the input of at least one of an at least one main battery voltage sensor, an at least one main battery amperage sensor, an at least one auxiliary battery voltage sensor, and an at least one auxiliary amperage sensor.

[c27] 27. The multiple battery system of claim 3, wherein the controller includes a trigger that signals the controller to periodically change the switch position of the at least one switching device so as to discharge the at least one auxiliary battery in the second operating position of the at least two operating positions for short periods and then switch back to the first operating position of the at least two operating positions.

[c28] 28. The multiple battery system of claim 26, further comprising an at least one VI sensor.

[c29] 29. The multiple battery system of claim 3, wherein the

multiple batteries are part of an at least one of a six-volt, a twelve-volt, a fourteen-volt, and a twenty-four volt battery electrical system.

[c30] 30. A network controlled multiple battery system comprising:
a network in communication with a network interfaceable controller;
an at least one sensor sensing the condition of an at least one main battery;
an at least one controlled switching device coupled to the at least one network interfaceable controller and responding to an at least one signal from the network to the network interfaceable controller switching from the main battery to an at least one auxiliary battery.

[c31] 31. The network controlled multiple battery system of claim 30, wherein the main battery further comprises a main positive output and a main negative output and wherein the at least one auxiliary battery further comprises an at least one auxiliary positive output and an at least one auxiliary negative output

[c32] 32. The network controlled multiple battery system of claim 31, wherein the at least one controlled switching device switches between an at least two operating positions, each position selectively coupling a common ter-

minal with at least one of the at least one main output and at least one auxiliary output.

- [c33] 33. The network controlled multiple battery system of claim 32, wherein a first operating position of the at least two operating positions provides charge to the main battery and provides charge to the at least one auxiliary battery through a one-way charging circuit.
- [c34] 34. The network controlled multiple battery system of claim 33, wherein a second operating position of the at least two operating positions couples the at least one positive auxiliary output of the at least one auxiliary battery to a common positive terminal.
- [c35] 35. The network controlled multiple battery system of claim 33, wherein the at least one one-way charging circuit includes an at least one one-way charging diode.
- [c36] 36. The network controlled multiple battery system of claim 35, wherein the at least one one-way charging diode further comprises an at least one silicon rectifier.
- [c37] 37. The network controlled multiple battery system of claim 35, wherein the at least one one-way charging diode further comprises an at least one Silicon Controlled Rectifier (SCR).

- [c38] 38. The network controlled multiple battery system of claim 37, wherein the at least one Silicon Controlled Rectifier (SCR) is coupled to the controller and shuts off if an over charge condition is detected in the auxiliary battery.
- [c39] 39. The network controlled multiple battery system of claim 30, wherein the at least one controlled switching device has at least two operating positions, a first operating position of the at least two operating positions coupling a common positive terminal to a main positive output of the main battery and to a one-way charging circuit that precedes and is coupled to an at least one auxiliary positive output of the at least one auxiliary battery and a second operating position wherein the common positive terminal is coupled to the at least one auxiliary positive output of the at least one auxiliary battery a point in the system beyond the one-way charging circuit, effectively isolating the main battery directly connecting the at least one auxiliary battery.
- [c40] 40. The network controlled multiple battery system of claim 30, further comprising an at least one indicator element.
- [c41] 41. The network controlled multiple battery system of claim 40, wherein the at least one indicator element has an at least one light emitting diode of an at least one

color.

- [c42] 42. The network controlled multiple battery system of claim 40, wherein the at least one indicator element is a plurality of indicator elements having at least one of a red, orange, green, and amber color.
- [c43] 43. The network controlled multiple battery system of claim 40, wherein the at least one indicator is an at least one of a klaxon, a horn, a light, a plurality of lights, an LCD panel, a simulated human voice, a human voice, a light emitting diode, and a plurality of light emitting diodes.
- [c44] 44. The network controlled multiple battery system of claim 30, wherein the at least one network interfaceable controller has an least one microprocessor, an at least one signal transmitter, an at least one signal receiver, a security protocol/encryption element, an indicator element, an input/output bus.
- [c45] 45. The network controlled multiple battery system of claim 39, the at least one sensor is an at least one VI sensor.
- [c46] 46. The network controlled multiple battery system of claim 39, wherein the multiple batteries are part of an at least one of a six-volt, a twelve-volt, a fourteen-volt,

and a twenty-four volt battery electrical system.

- [c47] 47. A multiple battery system comprising:
- a battery housing having a common positive terminal and a common negative terminal coupled to an electrical system;
 - a main battery having a main positive output and a main negative output;
 - an at least one auxiliary battery having an auxiliary positive output and an auxiliary negative output;
 - an at least one switching device with at least two operating positions, the at least two operating positions selectively engaging said main battery and said at least one auxiliary battery and comprising:
 - a first operating position of said at least two operating positions, wherein the common positive terminal is coupled to the main positive output and is further coupled to the at least one auxiliary battery output through a one-way charging circuit between and preceding the at least one auxiliary battery;
 - a second operating position of said at least two operating positions which couples the common positive terminal to the auxiliary positive such that the common positive terminal is coupled at a point beyond the one-way charging circuit to the auxiliary battery positive output;
 - and

a controller coupled to and switching said at least one switching device.

- [c48] 48. The multiple battery system of claim 47, wherein the second operating position couples the at least one auxiliary battery with the electrical system and prevents electrical energy in the at least one auxiliary battery from flowing to the main battery.
- [c49] 49. The multiple battery system of claim 47, wherein the one-way charging circuit electrically isolates the main battery in the second operating position.
- [c50] 50. The multiple battery system of claim 47, wherein the at least one auxiliary battery further comprises a single auxiliary battery.
- [c51] 51. The multiple battery system of claim 47, wherein the at least one auxiliary battery further comprises a plurality of auxiliary batteries.
- [c52] 52. The multiple battery system of claim 47, wherein the one-way charging circuit comprises an at least one one-way charging diode.
- [c53] 53. The multiple battery system of claim 52, wherein the at least one one-way charging diode further comprises an at least one silicon rectifier.

- [c54] 54. The multiple battery system of claim 52, wherein the at least one one-way charging diode further comprises an at least one Silicon Controlled Rectifier (SCR).
- [c55] 55. The multiple battery system of claim 54, further comprising at least one sensor in communication with the controller.
- [c56] 56. The multiple battery system of claim 55, wherein the controller actuates the switching device based on input from the at least one sensor and the at least one sensor includes at least one of an at least one main battery voltage sensor, main battery amperage, auxiliary battery voltage sensor, and auxiliary amperage sensor.
- [c57] 57. The multiple battery system of claim 47, further comprising an at least one indicator element.
- [c58] 58. A method of controlling a multiple battery system, comprising the method steps of:
polling an at least one sensor;
detecting an abnormal reading from said at least one sensor;
communicating the results of said detection step to an operator or a Network Operations Center;
switching, upon a command from the operator, the Network Operations Center or a controller, from a main bat-

tery to an at least one auxiliary battery; and confirming the operation of the system.

[c59] 59. The method of controlling a multiple battery system of claim 58, further comprising after the communicating step the method step of initiating energy conservation steps.

[c60] 60. The method of controlling a multiple battery system of claim 58, further comprising the method step of monitoring electrical generation and transmission into the system.

[c61] 61. The method of controlling a multiple battery system of claim 60, further comprising, after the confirming step, the method step of switching back to normal operating mode or alerting the operator or NOC to an electrical fault condition.

[c62] 62. The method of claim 58, further comprising, after the polling step, the additional method steps of:
detecting a cycling trigger or flag;
switching, upon detection of a trigger or flag, to the at least one auxiliary battery;
monitoring the at least one auxiliary battery for discharge, adequate recharge and normal operation;
running the electrical system on the auxiliary battery for

period of time;

checking the at least one auxiliary battery for discharge through the at least one sensor; and

returning the at least one switch back to engage the main battery.